

Applicants: Pulkkinen et al.  
Application Serial No.: 10/046,668  
Filing Date: January 14, 2002  
Docket No.: 187-64  
Reply to Final Office Action mailed May 19, 2004  
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### REMARKS

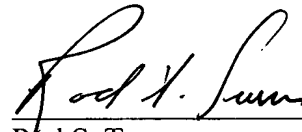
The Advisory Action mailed November 16, 2004, the Office Action mailed May 19, 2004, and the references cited therein have been carefully considered. Claim 1 has been amended in a sincere effort to further clarify that the claimed heart rate monitor is adapted for being a carry-on heart rate monitor.

Support for this Amendment is found generally within the specification, claims, and drawings, as originally filed. Specifically, support for the amendment to Claim 1 is provided at page 1, paragraphs 1 and 2; and page 3, paragraph 16 through page 5, paragraph 23.

In view of the foregoing Amendment and remarks, entry of the amendments to Claim 1; favorable consideration of Claim 1, as amended; favorable reconsideration of Claims 2-19; and allowance of pending Claims 1-19 are respectfully and earnestly solicited.

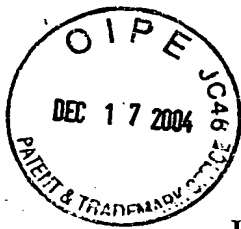
The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 08-2461. A duplicate copy of this sheet is attached.

Respectfully submitted,



Rod S. Turner  
Registration No.: 38,639  
Attorney for Applicants

HOFFMANN & BARON, LLP  
6900 Jericho Turnpike  
Syosset, New York 11791  
(516) 822-3550  
RST/jp



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/046,668  
Applicant : Pulkkinen et al.  
Filed : January 14, 2002  
Title : HEART RATE MONITOR

TC/A.U. : 3762  
Examiner : Roderick D. Bradford

Confirmation No. : 2302  
Docket No. : 187-64  
Dated : October 18, 2004

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

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on October 18, 2004*

Signed: Maurice Esposito

**REPLY TO FINAL OFFICE ACTION**

Sir:

In response to the final Office Action mailed May 19, 2004, a reply to which is due by October 19, 2004 with a Petition for Extension of Time submitted herewith, please amend the above-identified application as follows:

**Amendments to the Claims** are reflected in the listing of claims that begins on page 2 of this paper.

**Remarks** begin on page 7 of this paper.

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## IN THE CLAIMS:

The following listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A carry-on heart rate monitor measuring a person's heart rate non-invasively, the heart rate monitor comprising a display for displaying heart rate information about a heart rate signal measured on the person, the display comprising a display element for displaying a settable minimum limit for a desired heart rate level, a display element for displaying a settable maximum limit for a desired heart rate level, a display element unit controlled by the measured heart rate level and provided with several display element segments, at least one of the display element segments controlled by the measured heart rate level graphically representing the heart rate level by a position of the at least one display element segment relative to the display element for displaying the settable minimum limit for the desired heart rate level and the display element for displaying the settable maximum limit for the desired heart rate level,

wherein the display element for displaying a settable minimum limit for the heart rate level is located at a first end of the display element unit controlled according to the heart rate level, on the same side of the display as the first end of the display element unit, and that the display element for displaying a settable maximum limit for the heart rate level is located at a second end of the display element unit controlled according to the heart rate level, on the same side of the display as the second end of the display element unit.

2. (Original) A heart rate monitor as claimed in claim 1, wherein the display element for displaying a settable minimum limit for the heart rate level and the first end of the display element unit controlled according to the heart rate level are located on the same side of the display with respect to both a center line of the display parallel to the reading

direction of the display and a center line of the display perpendicular to the reading direction of the display.

3. (Previously Presented) A heart rate monitor as claimed in claim 1, wherein the display element for displaying a settable maximum limit for the heart rate level and the second end of the display element unit controlled according to the heart rate level are located on the same side of the display with respect to both a center line of the display parallel to the reading direction of the display and a center line of the display perpendicular to the reading direction of the display.

4. (Original) A heart rate monitor as claimed in claim 1, wherein the display element for displaying a settable minimum limit for the heart rate level and the first end of the display element unit controlled according to the heart rate level are located on the same side of the display as the display element for displaying a settable maximum limit for the heart rate level and the second end of the display element unit controlled according to the heart rate level.

5. (Original) A heart rate monitor as claimed in claim 1, wherein the display element unit controlled on the basis of the measured heart rate level is directed such that the direction of motion of the indicator controlled on the basis of the measured heart rate level is substantially parallel to the reading direction of the display elements for the minimum limit and the maximum limit of the heart rate level.

6. (Original) A heart rate monitor as claimed in claim 1, wherein the heart rate monitor comprises means for selecting a display mode from a set of at least two display modes, i.e. a set comprising at least a first and a second display mode.

7. (Original) A heart rate monitor as claimed in claim 6, wherein in a first display mode, the minimum limit and the maximum limit for the heart rate level are shown as heart rate readings.

8. (Previously Presented) A heart rate monitor as claimed in claim 6, wherein in a second display mode, the minimum limit and the maximum limit for the heart rate level are shown as a proportion of the maximum heart rate.

9. (Original) A heart rate monitor as claimed in claim 1, wherein the indicator controlled on the basis of the measured heart rate level and located in the display element unit is different in the second and the first display mode.

10. (Original) A heart rate monitor as claimed in claim 9, wherein the means for changing the display mode are arranged to change the indicator controlled on the basis of the measured heart rate level in accordance with the display mode.

11. (Previously Presented) A heart rate monitor as claimed in claim 6, wherein the means for changing the display mode are arranged to change the same display mode for the display element for displaying the minimum limit for the heart rate level, the display element for displaying the maximum limit for the heart rate level, and for the actual main display element for the heart rate level contained in the heart rate monitor.

12. (Original) A heart rate monitor as claimed in claim 1, wherein the heart rate monitor is a heart rate monitor equipped with a fastening wristband and capable of attachment to a human hand, onto the wrist in particular.

13. (Original) A heart rate monitor as claimed in claim 1; wherein the heart rate monitor comprises means for measuring a heart rate signal, means for modifying the signal measured by the measurement means, data-processing means for finding out the heart rate level from the signal modified by the modification means, the data-processing means being connected to the display, and a user interface for controlling the operation of the heart rate monitor.

14. (Previously Presented) A heart rate monitor as claimed in claim 2, wherein the display element for displaying a settable maximum limit for the heart rate level and the second end of the display element unit controlled according to the heart rate level are located on the same side of the display with respect to both a center line of the display parallel to the reading direction of the display and a center line of the display perpendicular to the reading direction of the display.

15. (Previously Presented) A heart rate monitor as claimed in claim 7, wherein in a second display mode, the minimum limit and the maximum limit for the heart rate level are shown as a proportion of the maximum heart rate.

16. (Previously Presented) A heart rate monitor as claimed in claim 7, wherein the means for changing the display mode are arranged to change the same display mode for the display element for displaying the minimum limit for the heart rate level, the display element for displaying the maximum limit for the heart rate level, and for the actual main display element for the heart rate level contained in the heart rate monitor.

17. (Previously Presented) A heart rate monitor as claimed in claim 8, wherein the means for changing the display mode are arranged to change the same display mode for the display element for displaying the minimum limit for the heart rate level, the display

element for displaying the maximum limit for the heart rate level, and for the actual main display element for the heart rate level contained in the heart rate monitor.

18. (Previously Presented) A heart rate monitor as claimed in claim 9, wherein the means for changing the display mode are arranged to change the same display mode for the display element for displaying the minimum limit for the heart rate level, the display element for displaying the maximum limit for the heart rate level, and for the actual main display element for the heart rate level contained in the heart rate monitor.

19. (Previously Presented) A heart rate monitor as claimed in claim 10, wherein the means for changing the display mode are arranged to change the same display mode for the display element for displaying the minimum limit for the heart rate level, the display element for displaying the maximum limit for the heart rate level, and for the actual main display element for the heart rate level contained in the heart rate monitor.

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## REMARKS

The Office Action mailed May 19, 2004 and the references cited therein have been carefully considered. Claim 1 has been amended in a sincere effort to further clarify that which Applicants regard as the invention.

Support for this Amendment is found generally within the specification, claims, and drawings, as originally filed. Specifically, support for the amendment to Claim 1 is provided at page 2, paragraphs 7 and 8; page 5, paragraphs 25 and 26; page 6, paragraphs 27-29; page 7, paragraphs 30 and 31; and page 8, paragraphs 32-35 of the specification.

Claims 1-3, 13, and 14 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,458,548 to Crossing et al. (*Crossing*). Claims 4 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Crossing*. Claims 1-12 and 14-19 were rejected as being unpatentable over U.S. Patent No. 6,345,197 to Fabrizio et al. (*Fabrizio*).

The present invention is directed to a carry-on heart rate monitor measuring a person's heart rate non-invasively. The heart rate monitor includes a display for displaying heart rate information about a heart rate signal measured on the person. The display includes a display element for displaying a settable minimum limit for a desired heart rate level, a display element for displaying a settable maximum limit for a desired heart rate level, and a display element unit controlled by the measured heart rate level provided with several display element segments.

At least one of the display element segments controlled by the measured heart rate level graphically represents the heart rate level by a position of the at least one display element segment relative to the display element for displaying the settable minimum limit for the desired heart rate level and the display element for displaying the settable maximum limit for the desired heart rate level, as defined by amended Claim 1.

As shown in Figures 1-4, *Crossing* is exclusively directed to a display that is securely integrated to a stable fitness device 22, 37, 41, and thus does not teach or suggest a carry-on heart rate monitor as defined by Claim 1. The *Crossing* device remains entirely motionless during use and can be viewed as long as the user wishes without interfering with the user's motion during exercise. However, the subject invention, as defined by Claim 1, is a carry-on or personal heart rate monitor, which permits a substantial amount of information to be transferred during short glances. This is required since the user is not afforded the luxury of being able to stare at a display for long periods of time without disrupting his ability to move during exercise, as disclosed at page 1, paragraph 1; page 2, paragraphs 7 and 8; page 3, paragraphs 16-18; and page 4, paragraphs 20-22; and Figures 1-3.

Further, Figure 8 in *Crossing* merely shows a numeric display of the actual heart rate, which happens to be located between separate numeric displays for the minimum and maximum heart rates, without any disclosure of a purpose, criticality, or unexpected result caused by such a placement. Thus, nothing in *Crossing* would teach or suggest a graphical representation or illustration of the height or level of the current heart rate relative to the minimum and maximum limits of the desired heart rate level, as defined by amended Claim 1 and disclosed at page 2, paragraph 8; page 5, paragraphs 23-26 and Figures 4-6 of the specification.

This is achieved in the present invention by a novel manner of placing a display element unit 210, and its segments 211 to 220, with respect to a display element 201, which indicates a desired minimum limit for the heart rate, and a display element 202, which indicates a desired maximum limit for the heart rate, to illustrate the position of the current heart rate level relative to these limits, as disclosed at page 5, paragraph 26 of the specification. *Crossing* merely describes a numeric display, which performs the same function as the display 500 shown in Figures 4-6 of the subject application, rather than a

graphical display with which the user can more easily visualize the position of his current heart rate relative to minimum and maximum limits, as defined by Claim 1.

Further, it is maintained that the location of the numeric element 120 in *Crossing* does not change its position relative to the elements indicating the minimum 104 and maximum 130 heart rate limits, as defined by Claim 1. A user's heart rate is normally between 30 and 220 beats per minute. *Crossing* does not disclose that digits in its numeric display are deactivated when not in use. For all the reader knows, the *Crossing* display could use leading and/or trailing zeroes and/or some other symbol to indicate inactivity.

Even if it is assumed that this is not the case, there is only one point (between 99 and 100) at which the third digit of the numeric display in *Crossing* may appear or disappear from the display. However, this results in a display that is absurdly inaccurate. In addition, the vast majority of users are not interested in heart rate levels during exercise that use only two digits (below 100), which would also render the change between two and three digits irrelevant.

Further, regardless of the change in actual heart rate, the right hand side of the numeric display in *Crossing* remains the same and is thus inoperable for illustrating tendencies towards the minimum heart rate level. Thus, using the mere appearance or disappearance of the third digit in the numeric display of *Crossing* to represent the measured heart rate level by a position of a least one display element segment relative to minimum and maximum display elements is ultimately inoperable to the ordinary user, and thus borders on the absurd.

Likewise, *Fabrizio* teaches only a numeric display, which does not provide a representation of the actual heart rate relative to minimum and maximum heart rate levels since each of these displays occupies the exact same location, albeit at different times. Thus, when viewing the actual heart rate in *Fabrizio*, the user cannot be provided with a

representation of the actual heart rate relative to the maximum or minimum heart rate limits, as defined by Claim 1. As indicated above, representing the relationship between the current heart rate and its limits as a function of position relative to these limits significantly reduces the amount of cognitive thought, which is substantially reduced during strenuous activity or exercise, required for comprehension by the user when compared with the purely numeric displays shown in *Crossing* or *Fabrizio*.

The Office Action indicates that *Fabrizio* fails to disclose a display element for displaying a settable minimum limit being located at a first end of the display element unit and a display element for displaying a settable maximum limit being located at a second end of the display element unit. However, the Office Action states that it would have been obvious to modify the device in *Fabrizio* to include this feature since the Applicant did not disclose criticality and/or unexpected results of this feature, and it appears that the invention would perform equally well with any display element unit, such as that described in *Fabrizio*.

Applicants respectfully disagree with the contention that the invention would perform equally well with any type of display unit. By incorporating at least one display element segment that represents the actual heart rate level by its position relative to a display element for displaying a settable minimum limit and a display element for displaying a settable maximum limit, the monitor is able to provide an illustration of heart rate that is substantially faster and easier to comprehend during exercise than either of the numeric displays described in *Crossing* or *Fabrizio*, as well as any of the conventional alternatives currently available. This is particularly true when the user can only glance quickly at the monitor or there is movement between the user's eye and the display, which typically occur during exercise, as disclosed at page 1, paragraph 4, and page 2, paragraphs 7 and 8 of the specification.

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Applicants respectfully note that in order to support a claim of *prima facie* anticipation, a single reference must teach or enable each of the claimed elements as arranged in the claim interpreted by one of ordinary skill in the art. Further, in order to support a claim of *prima facie* obviousness, the cited references must teach or suggest each and every element of the invention, and there must be a motivation in the references or the prior art to combine the references and the prior art as suggested.

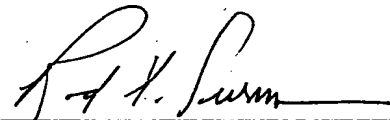
However, nothing in the art of record would teach or suggest, either alone or in combination, a carry-on heart rate monitor that measures a person's heart rate non-invasively, wherein at least one of the display element segments controlled by the measured heart rate level graphically represents the heart rate level by a position of the at least one display element segment relative to the display element for displaying the settable minimum limit for the desired heart rate level and the display element for displaying the settable maximum limit for the desired heart rate level, as defined by amended Claim 1.

Applicants respectfully submit that Claims 2-19, which ultimately depend from Claim 1, are patentable over the art of record by virtue of their dependency from Claim 1. Further, Applicants submit that Claims 2-19 define patentable subject matter in their own right. Therefore, it is respectfully requested that the rejection of Claims 1-3, 13, and 14 under 35 U.S.C. § 102(b) and the rejection of Claims 1-12 and 14-19 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

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In view of the foregoing Amendment and remarks, entry of the amendments to Claim 1; favorable consideration of Claim 1, as amended; favorable reconsideration of Claims 2-19; and allowance of pending Claims 1-19 are respectfully and earnestly solicited.

Respectfully submitted,



Rod S. Turner  
Registration No.: 38,639  
Attorney for Applicants

HOFFMANN & BARON, LLP  
6900 Jericho Turnpike  
Syosset, New York 11791  
(516) 822-3550  
RST:me